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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,362	08/25/2006	Jiansheng Fu	WHKY-00101-NUS	3176
33794	7590	07/20/2010	EXAMINER	
MATTHIAS SCHOLL 14781 MEMORIAL DRIVE SUITE 1319 HOUSTON, TX 77079			PARVINI, PEGAH	
			ART UNIT	PAPER NUMBER
			1793	
			NOTIFICATION DATE	DELIVERY MODE
			07/20/2010	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/598,362	<b>Applicant(s)</b> FU ET AL.	
	<b>Examiner</b> PEGAH PARVINI	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11 and 13-31 is/are pending in the application.
- 4a) Of the above claim(s) 18-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11, 13-17 and 24-31 is/are rejected.
- 7) ☒ Claim(s) 25-27 and 29-31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Any rejection and/or objection made in the previous Office Action and not repeated below are hereby withdrawn.

#### ***Response to Amendment***

This Office Action is in reply to the amendments filed April 29, 2010. After entry of the amendments, claims 11 and 13-31 are currently pending in this application with claims 18-23 being withdrawn.

#### ***Claim Objections***

**Claims 25-27 and 29-31** are objected to because of the following informalities: the status identifier of said claims reads as “Previously presented”; however, these are “New” claims.

Nevertheless, in the reply to this Office Action, Applicants should not change the status identifiers to “New” as it will be improper at that point; they should be remained as “Previously presented”.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 24-31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear as to what range applicants are referring to by reciting “well-defined” optical thickness in the recitations of instant claims 24 and 28.

Claims 25-27 and 29-31 are considered rejected as being dependent upon rejected claims 24 or 28.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 11, 13-16, 24-26, and 28-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,579,355 to Schmidt et al. in view of U.S. Patent No. 6,485,556 to DeLuca, Jr. and in view of U.S. Patent No. 6,238,471 to Vogt et al.

Schmidt et al. teach multiply coated platelet-shaped substrates such as natural or synthetic mica coated with (A) a high refractive index layer such as TiO<sub>2</sub>, then with (B) a colorless coating having a low refractive index and optionally (C), an outer protective layer (Abstract; column 2, lines 40-45; column 3, lines 44-48; column 3, lines 60-65).

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However, the reference makes it clear that the particular preference is given to a construction of three optical interference layers in the order of (A) (B) (A) and optionally (C) (column 3, lines 41-45). In addition, the reference discloses  $\text{SiO}_2$  as a colorless low refractive index layer used (column 3, lines 60-65).

It is to be noted that based on the teachings of Schmidt et al., it is clear that the layers are placed onto each other and no other layers comes between them. Thus, the limitations drawn to layers being "in direct contact" as recited in the language of instant claims are considered to have been met.

Moreover, regarding the thicknesses (i.e. geometrical thicknesses) of the layers, Schmidt et al. disclose that "the thickness of any one metal oxide layer – independent of the refractive index - is generally within the range of from about 10 to about 1000 nm". Therefore, considering the formula  $b = n \cdot d$  wherein "b" represents optical thickness, "n" represents the refractive index, and "d" represents the geometric thickness, and considering the refractive index of  $\text{TiO}_2$  to be 2.6-2.9 as evidenced by DeLuca, Jr. in column 3, lines 14-16 and the refractive index of  $\text{SiO}_2$  to be 1.35-1.80 as evidenced by Vogt et al. in column 4, lines 5-10, an optical thickness range of about 26nm to about 2900nm for the  $\text{TiO}_2$  (i.e. first optical thickness) and an optical thickness range of about 13.5nm to about 1800nm for the  $\text{SiO}_2$  (i.e. second optical are being calculated. Considering the detailed explanation provided in the Remarks filed April 29, 2010 on the meaning of the "first optical thickness" being greater than "an optical thickness of silver-white interference color" and smaller than "an optical thickness of golden-yellow interference color", and the "second optical thickness" being greater than "an optical

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thickness of a 2<sup>nd</sup> order interference color” and smaller than “an optical thickness of a 4<sup>th</sup> order interference color”, and taking into account the interference color chart referred to by Applicants in page 9 of the Remarks, it is quite clear and obvious that there is substantially overlapping ranges of the “first optical thickness” and the “second optical thickness” according to the recitation of the claims and the meanings clarified in the Remarks.

In other words, according to the interference color chart provided by Applicants (i.e. provided via the internet link), an optical thickness which is greater than an optical thickness of silver-white interference color but smaller than an optical thickness of golden-yellow interference color is roughly between the range of about 300nm to about 800nm. The optical thickness of titanium dioxide as calculated based on the range of refractive index and the range of geometrical thicknesses provided by the references cited above result in an optical thickness range of roughly about 26nm to about 2900nm which clearly has overlapping ranges with the “first optical thickness” as instantly presented by Applicants.

Furthermore, according to the interference color chart provided by Applicants (i.e. provided via the internet link), an optical thickness which is greater than an optical thickness of a 2<sup>nd</sup> order interference color or that is greater than an optical thickness of a 2<sup>nd</sup> order green interference color but smaller than an optical thickness of a 4<sup>th</sup> order interference color is roughly greater than 1100nm or between the range of about 1100nm to about 1650nm respectively. The optical thickness of silicon dioxide as calculated based on the range of refractive index and the range of geometrical

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thicknesses provided by the references cited above result in an optical thickness range of roughly about 13.5nm to about 1800nm which clearly has overlapping ranges with the “second optical thickness” as instantly presented by Applicants.

Overlapping ranges have been held to establish *prima facie* obviousness. See MPEP 2144.05. Thus, Schmidt et al. clearly make the instant claims obvious absence evidence proving the contrary.

According to the above, the first and second optical thicknesses are taken to be clearly well defined specially in the absence of any specific description as to what is meant by “well-defined” in the specification; in other words, the claims and specification do not provide any range of optical thickness as well-defined thickness. Thus, the reference is seen to read on instant limitation specially in view of the fact that it makes the instant claims obvious as detailed above and continued below.

With reference to the pigment exhibiting a color-shift effect, it is to be noted that while the reference discloses a similar pigment, the characteristic of color-shift effect is expected to follow from the composition/product of the instant reference absence clear and specific proof to the contrary.

It is to be noted that as evidenced from above, DeLuca, Jr. and Vogt et al. were merely relied on for their express teaching on the values of refractive index for titanium dioxide and silicon dioxide; in other words, they are, hereby, used as evidences.

**Claims 17, 27 and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. in view of DeLuca, Jr. and Vogt et al. as applied to claim 11 above, and further in view of U.S. Patent No. 4,482,389 to Franz et al.

Schmidt et al., as detailed above, disclose a multiply coated platelet-shaped substrate such as mica coated with a high refractive index layer metal oxide such as  $\text{TiO}_2$  and then a low refractive index layer metal oxide such as  $\text{SiO}_2$ , and further coated with a protective coating in which the first and the second optical thicknesses would clearly have overlapping ranges with the optical thickness calculated for the titanium dioxide and silicon dioxide layers.

Schmidt et al. further disclose that in order to increase light, water and weather stability, it is frequently advisable, depending on the field of use, to subject the ready-produced pigment to an aftertreatment or aftercoating ([0030]). The reference, additionally, cites a number of references such as DE 3235017 (i.e. U.S. Pat. No. 4,483,389) for their useful aftercoatings or aftertreatments, and continues by making a reference to the protective coating disclosed in Schmidt et al., and discloses that this protective coating further enhances the chemical stability and/or facilitates the handling of the pigment, especially its incorporation into various media ([0030]).

However, Schmidt et al. do not expressly and literally point to a specific type of such aftercoatings or aftertreatments. Nevertheless, it would have been obvious to have utilized iron and/or manganese and chromium for such outer protective coating to enhance stability of the pigment wherein the outer protective coating is applied onto pigments comprising of mica substrates already coated with metal oxides as that taught



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by Franz et al. (Abstract; column 1, line 66 to column 2, lines 6) motivated by the fact that Schmidt et al. clearly points to Franz et al. reference (i.e. DE 3235017) as an example of some of the references teaching such aftercoatings or aftertreatments (i.e. protective coatings) over the pigments comprising of multiply coated mica substrates with metal oxides because said aftercoatings or aftertreatments increase and enhance the stability of the pigments and facilitate the handling of the pigments as that clearly taught by Schmidt et al. when referring to Franz et al. and other references. It is to be noted that the iron salt taught by Franz et al. is  $\text{FeSO}_4$  which can be found in the examples. Furthermore, Franz et al. is drawn to pigments having improved stability to weathering.

Thus, it is within the scope of a skilled artisan to have modified Schmidt et al. in order to provide an outer protective layer of an organic or an inorganic ferrous pigment based on Franz et al.

### ***Response to Arguments***

Applicants' arguments filed April 29, 2010 have been fully considered but they are not persuasive.

While the Examiner appreciate the explanation provided in the Remarks filed April 29, 2010 to further clarify the first and second optical thickness and "silver-white interference color", "golden-yellow interference color", "2<sup>nd</sup> order interference color", and "4th order interference color", it is noted that the Schmidt et al. reference relied on previously clearly discloses an overlapping ranges of optical thickness for both high

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refractive index metal oxide and low refractive index metal oxide with the ones instantly claimed by the phrases such as “greater than an optical thickness of silver-white interference color and smaller than an optical thickness of golden-yellow interference color” (i.e. about 300nm to about 800nm), “greater than an optical thickness of a 2<sup>nd</sup> order interference color” (i.e. greater than 1100nm), and “greater than an optical thickness of a 2<sup>nd</sup> order green interference color and smaller than an optical thickness of a 4<sup>th</sup> order interference color” (i.e. about 1100nm to about 1650nm).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/  
Examiner, Art Unit 1793

/Anthony J Green/  
Primary Examiner, Art Unit 1793